APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/724,897	12/02/2003	Yuan-Chi Chang	YOR920030555US1	2439

21254	7590	11/27/2006

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EXAMINER
PHAM, HUNG Q

ART UNIT	PAPER NUMBER
2168	

DATE MAILED: 11/27/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

<table>
<tr>
<td rowspan="3"><i>Office Action Summary</i></td>
<td colspan="2">Application No.</td>
<td colspan="2">Applicant(s)</td>
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<tr>
<td colspan="2">10/724,897</td>
<td colspan="2">CHANG ET AL.</td>
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<td colspan="2">Examiner</td>
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<td colspan="2">HUNG Q. PHAM</td>
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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *15 September 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-6,8-19,21-31 and 33-37* is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-6,8-19,21-31 and 33-37* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☐ All b)☐ Some * c)☐ None of:

        1.☐ Certified copies of the priority documents have been received.

        2.☐ Certified copies of the priority documents have been received in Application No. _____.

        3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1)☒ Notice of References Cited (PTO-892)

2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3)☐ Information Disclosure Statement(s) (PTO/SB/08)
    Paper No(s)/Mail Date _____.

4)☐ Interview Summary (PTO-413)
    Paper No(s)/Mail Date. _____ .

5)☐ Notice of Informal Patent Application

6)☐ Other: _____.

DETAILED ACTION

Response to Arguments

Applicants' arguments with respect to the rejection of claims 1-37 under 35

U.S.C. § 102 and 103 have been considered but are moot in view of the new ground(s)

of rejection.

Claim Rejections - 35 USC § 101

35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or
> composition of matter, or any new and useful improvement thereof, may obtain a patent
> therefor, subject to the conditions and requirements of this title.

Claims 1-6, 8-19, 21-31 and 33-37 are rejected under 35 U.S.C. 101 because

the claimed invention is directed to non-statutory subject matter.

The claimed invention as recited in claims 1-6, 8-19, 21-31 and 33-37 is directed

to non-statutory subject matter because the claim does not require any physical

transformation and the invention as claimed does not produce a useful and tangible

result in view of MPEP 2106 (IV)(C)(2)((B))((2))(a) and (b)[1].

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[1] MPEP 2106 (IV)(C)(2)((B))((2))(a) and (b):
For an invention to be "useful" it must satisfy the utility requirement of section 101. The USPTO's official interpretation of
the utility requirement provides that the utility of an invention has to be (i) specific, (ii) substantial and (iii) credible. MPEP
§ 2107 and Fisher, 421 F.3d at 1372, 76 USPQ2d at 1230 (citing the Utility Guidelines with approval for interpretation of
"specific" and "substantial"). In addition, when the examiner has reason to believe that the claim is not for a practical
application that produces a useful result, the claim should be rejected, thus requiring the applicant to distinguish the claim
from the three 35 U.S.C. 101 judicial exceptions to patentable subject matter by specifically reciting in the claim the
practical application. In such cases, statements in the specification describing a practical application may not be sufficient
to satisfy the requirements for section 101 with respect to the claimed invention. Likewise, a claim that can be read so
broadly as to include statutory and nonstatutory subject matter must be amended to limit the claim to a practical
application. In other words, if the specification discloses a practical application of a section 101 judicial exception, but the
claim is broader than the disclosure such that it does not require a practical application, then the claim must be rejected.

The tangible requirement does not necessarily mean that a claim must either be tied to a particular machine or apparatus
or must operate to change articles or materials to a different state or thing. However, the tangible requirement does
require that the claim must recite more than a 35 U.S.C. 101 judicial exception, in that the process claim must set forth a
practical application of that judicial exception to produce a real-world result.

Claims 14-25 direct to a signal-bearing medium that stores program instructions.

Signal-bearing medium as defined in the specification (Page 19 Lines 5-9) includes

transmission media such as digital and analog and communication links and wireless. A

digital or analog or wireless signal encoded with functional descriptive material does not

fall within any of the categories of patentable subject matter. Therefore, claims 14-25 are

non-statutory (As set forth in § 101, a claimed signal is clearly not a process under § 101

because it is not a series of steps. A claimed signal has no physical structure, does not

itself perform any useful, concrete and tangible result, and does not fit within the

definition of a machine. A claimed signal is not matter, but a form or energy, and

therefore is not a composition of matter or product).

Claims 26-37 direct to a system comprising software per se. Software per se

does not fall within any of the categories of patentable subject matter. Therefore, claims

26-37 are non-statutory.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that

form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in
public use or on sale in this country, more than one year prior to the date of application for patent in
the United States.

Claims 1-6, 8, 9, 12-19, 21, 22, 25-31, 33, 34 and 37 are rejected under 35

U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as

obvious over Bergman et al. [PetroSPIRE: A multi-modal content-based retrieval

system for petroleum applications] and Li et al. [Comparing Texture Feature Sets for Retrieving Core Images in Petroleum Application].

Regarding claims 1, 13, 14 and 26, Bergman teaches *a method for storing a semantic object* (Bergman, Abstract), the method comprising:

summarizing attributes of said semantic object (Bergman, Page 457 Lines 45-47, extracting a vector of feature values);

indexing the summary of attributes (Bergman, Pages 457 Lines 50-51, indexing feature values); and

storing the summary of attributes and the index of the summary of attributes (Bergman, Page 457 Lines 45-46, storing vector of extracted features values of the semantic object; Page 457 Line 50, storing the index of feature values as an R-Tree), *wherein said summary of attributes comprises one of a slice label, a signal strength, and a coordinate of a surveyed segment* (Bergman, Page 454 Lines 11-15, features is assigned a semantic label as *slice label*).

The missing of Bergman is *geological seismic survey data* for deriving semantic object.

However, as taught by Bergman at Page 457 Lines 32-42, within SPIRE, different texture feature sets are selected and analyzed from a large library of feature sets. SPIRE implements the Li's algorithm, which takes as input a collection of image region sets, where each set contains homogeneous examples of a particular type of texture and generates a set of texture features that best distinguishes between examples for well bore images. As taught by Li at Page 2, in petroleum exploration, other than core images, *geological seismic survey data*, e.g., seismic data, well-log sensory data is used.

By incorporating Li's technique in SPIRE, *geological seismic survey data*, e.g., seismic

data, well-log sensory data, is an inherited feature for generating texture features.

Regarding claim 1, 13, 14 and 26, Bergman teaches *a method for storing a semantic*

object (see Abstract), the method comprising:

summarizing attributes of said semantic object (Page 457 Lines 45-47, extracting a

vector of feature values);

indexing the summary of attributes (Pages 457 Lines 50-51, indexing feature values);

and

storing the summary of attributes and the index of the summary of attributes (Page 457

Lines 45-46, storing vector of extracted features values of the semantic object; Page 457

Line 50, storing the index of feature values as an R-Tree), *wherein said summary of attributes*

comprises one of a slice label, a signal strength, and a coordinate of a surveyed segment (Page 454

Lines 11-15, features is assigned a semantic label as *slice label*).

The missing of Bergman is *geological seismic survey data* for deriving semantic

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However, as taught by Bergman at Page 457 Lines 32-42, within SPIRE,

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texture and generates a set of texture features that best distinguishes between

examples for well bore images. As taught by Li at Page 2, in petroleum exploration,

other than core images, *geological seismic survey data*, e.g., seismic data, well-log sensory

data is used.

By incorporating Li's technique in SPIRE, obviously *geological seismic survey data,*
e.g., seismic data, well-log sensory data, is used to generate texture features.

Regarding claims 2, 15, and 27, Bergman further discloses *the semantic object*
comprises a summary representation of raw data measurements (Bergman, Page 454 Lines 11-12,
indicating that features are extracted from raw data).

Regarding claims 3, 16, and 28, Bergman further discloses the step of *searching a*
database of a plurality of indexed attributes of semantic objects (Bergman, Page 459 Lines 33 and
41, querying a database which includes an index of texture features).

Regarding claims 4, 17, and 29, Bergman further discloses the step of *searching*
the index of the plurality of semantic object attributes to identify a semantic object having attributes that
match a query and retrieving the identified semantic object (Bergman, Page 452 Lines 18-20,
using a semantic definition to search the archive, and subsequently returning the
results).

Regarding claims 5, 18, and 30, Bergman further discloses *an optimizing mechanism*
is used in searching to optimize the process of searching (Bergman, Page 459 Lines 7-10,
indicating a dimensionality reduction algorithm that locally reduces the dimensionality of
the search space. Lines 5-6 indicate that the search process can be extremely time-
consuming if a linear scan is performed, hence, the dimensionality reduction algorithm is
presented as a time-saving optimization to the search process).

Regarding claims 6, 19, and 31, Bergman further discloses *the semantic object represents a model of a phenomena of interest that is measured by a collection of data which exceeds a data size that is accessible with a predetermined efficiency by multiple simultaneous users* (Bergman, Page 449 Lines 27 and 35, indicating that the semantic objects represent phenomena related to petroleum well-bore data, and that the volume of this data is extremely large).

Regarding claim claims 8, 21, and 33, Bergman further discloses *the index of the summary of attributes comprises a plurality of key features that have been resolved into a set of data points and summary statistics* (Bergman, Page 457 Lines 50-51, where summary statistics is read on feature values, because both consist of values summarized from a semantic object).

Regarding claim claims 9, 22, and 34, Bergman further discloses *the summary of attributes comprises one of a confidence level, summary statistics and a compact approximation* (Bergman, Page 457 Lines 46-47, where summary statistics is read on vector of feature values, because both consist of values summarized from a semantic object).

Regarding claims 12, 25, and 37, Bergman further discloses *the confidence level represents a degree of accuracy of classification for the semantic object* (Bergman, Page 458 Lines 12-14, indicating a similarity of zero or one between objects, zero indicating that the objects do not belong to the same class, one indicating that the objects do belong to the same class).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of

the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the

various claims was commonly owned at the time any inventions covered therein were

made absent any evidence to the contrary. Applicant is advised of the obligation under

37 CFR 1.56 to point out the inventor and invention dates of each claim that was not

commonly owned at the time a later invention was made in order for the examiner to

consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g)

prior art under 35 U.S.C. 103(a).

Claims 10, 11, 23, 24, 35 and 36 are rejected under 35 U.S.C. 103(a) as being

unpatentable over Bergman et al. [PetroSPIRE: A multi-modal content-based

retrieval system for petroleum applications] and Li et al. [Comparing Texture

Feature Sets for Retrieving Core Images in Petroleum Application] in view of

Smith et al. [A Framework for Mining Sequence Database at Multiple Abstraction

Levels].

Regarding claims 10, 23, and 35, Bergman does not explicitly teach *the compact*

approximation comprises a multiple segment polyline.

Smith teaches *the compact approximation comprises a multiple segment polyline* (Smith,

Page 268 Col. 1 Lines 1-8, segmenting data, then finding a linear approximation to each

segment. These line segments comprise a polyline, since a polyline is simply a line

comprised of one or more line segments (see Wikipedia definition of polyline included in

this Office Action)).

Therefore, it would have been obvious to one skilled in the art at the time the

invention was made to have modified the method of summarizing a semantic object

taught by Bergman by the method of approximating data by a polyline taught by Smith,

because approximating a semantic object by a polyline enables similarity searches,

particularly to identify data with similar geological features (Smith, Page 267, Col. 1

Lines 6-11 and Col. 2 Lines 4-6).

Regarding claims 11, 24, and 36, Smith further discloses *each segment of the*

multiple segment polyline comprises a best fit line having end point coordinates and a slope (Smith,

Page 270 Col. 1 Lines 22-25, showing the segments have endpoints; Page 270 Col. 1

Lines 41-43, showing the segments have a slope).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to HUNG Q. PHAM whose telephone number is 571-272-4040. The examiner can normally be reached on Monday-Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, TIM T. VO can be reached on 571-272-3642. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

HUNG Q PHAM
Examiner
Art Unit 2168

November 21, 2006